

# Clean Sustainable Water ... For All

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# Objective: Overall



# Objective: YSDGL

## My Project Objectives

### Literature Review (Self)

- Research
- Evangelise in schools/community
- Importance of safe water
- Risks of impure water

### Lab Work (Ecolab)

- Different water treatment methods
- Optimally sustainable methods
- Different sources of water and uses

### Community Impact (Safe Water Network)

- Place more water ATMs (public places / neighbourhoods)
- Drive awareness and usage
- Recommend improvements

# Literature Review 01 – Safe Water



## Importance

Our bodies are made of **60% water** that continually depletes due to breathing, sweating and digestion. Hence, water is essential to rehydrate ourselves



## Requirement

We typically need **8-10 glasses of water** daily; drinking water comes from groundwater or surface water



## Benefits (pure)

- Induces weight loss
- Helps fight fatigue
- Strengthens immune system
- Gives life to kidneys
- Lubricates joints
- Helps digest food, improve skin, reduce muscle inflammation, etc.



## Adverse Impact (impure)

Transmission of diseases such as:

- Cholera
- Diarrhea
- Dysentery
- Hepatitis A
- Typhoid
- Polio



# Literature Review 02 – Sustainable Treatment



## Pollutants

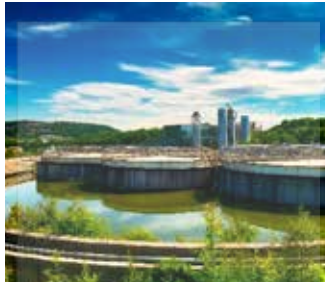
- Suspended solids
- Biodegradable organics
- Pathogens
- Nutrients (e.g., nitrogen, phosphates)
- Toxic chemicals
- Refractory organics
- Heavy metals
- Dissolved inorganics



## Acceptable Standards

IS10500:2012:

- pH value (6.5-8.5)
- Turbidity (1-5 NTU)
- Total hardness (200-600 mg/l of  $\text{CaCO}_3$ )
- Absence of e.coli
- Iron (1.0 mg/l of Fe)
- Agreeable odour and taste



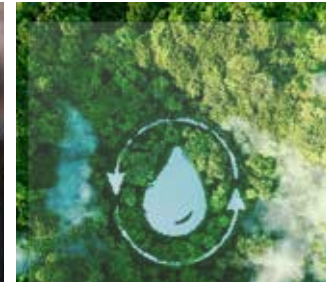
## Water Treatment Methods

- Filtration
- Sedimentation
- Distillation
- Sand filters
- Flocculation
- Chlorination
- Reverse osmosis
- UV Irradiation



## Impact on Environment

Each water treatment method has its own pros and cons, and has **varied impact on the environment** due to use of different chemicals or natural resources. RO is one of the most commonly accepted methods in households and local communities



## Sustainable

“For a treatment method to be sustainable, it should have less impact on the environment, have little to no carbon footprint, and be accessible to every community”



## Water Mgmt.

Water treatment and water management go hand-in-hand which include strategies such as:

- **Production:** Using natural resources (ocean, rivers, rain)
- **Reuse and Recycle:** Use wastewater disinfecting disease causing pathogens
- **Protection:** Restrict discharge of untreated wastewater into surface water bodies

# Literature Review 03 – For ALL

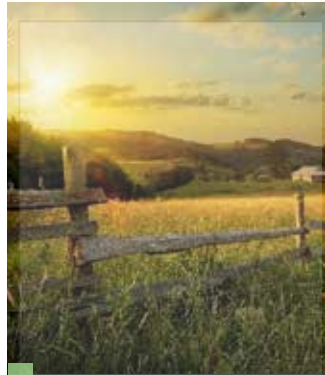


74% of population have access to safely managed drinking water services



At current rate of progress,

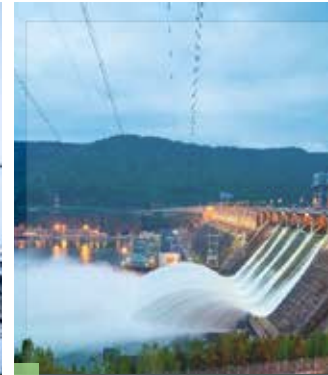
- 1.6 billion people will lack safely managed drinking water
- 2.8 billion people will lack safely managed sanitation
- 1.9 billion people will lack hand hygiene facilities in 2030



80% of these numbers live in rural areas



In India, Jal Jeevan aims to: “Provide safe and adequate drinking water by 2024 to all households in rural India”



Community approach

- Rural water supply strategy
- Water supply infrastructure
- Drinking water security
- Water supply systems
- Financial sustainability & assistance
- Awareness in community



Today there are 19,43,03,972 households of which only 11,54,87,538 have tap connections (59.44%)

# Achievements of Jal Jeevan Mission thus far



- 10 crore households with safe and clean drinking water
- 100% penetration in Goa, Telangana, Gujarat, Haryana, Puducherry, D&D, D&NH, A&N Islands
- 125 districts and 161,704 villages reported as “Har Ghar Jal”
- 85% schools and 81% Anganwadi Centers have potable tap water supply
- In FY22-23, more than 27.16 lakh water samples have been tested in labs and 57.99 Lakh samples tested using Field Test Kits



# Practical Experience



**Water ATMs:** Small scale water treatment stations machines that dispense water to consumers through card coin based mechanism. Typically operated by private contractors commissioned by govt agencies or NGOs



MCG Gurgaon set up 60 water ATMs



**I worked with 8 of them** (visited them, interviewed operators and customers, and observed the usage and adoption of the water ATMs) and have defined policy recommendations to help improve the quality and drive greater coverage and impact

# Plan going forward (CEA): Coverage.Execution.Adoption.



- Setting up **more water ATMs** (10x growth from 60 to 600 in Gurgaon area)
- Optimal **locations** for setup (e.g., open bazaars, railway stations, residential locations)
- **Geotagging** them accurately using Google Maps and MapMyIndia to facilitate access and monitoring
- **Women operators** (training, bringing them into the workforce, giving them a sense of identity)

- Work with **government agencies and NGOs** to set up many more ATMs (60 done)
- Work with **Google** to add water ATM as a specific “point of interest” category
- Work with **GMDA** to raise job requests especially for women; pay a premium to sub-contractor for women operators



# Plan going forward: C.E.A. (Execution)



- **Real time measurement** of water quality; recurrent checks in testing labs; certification process
- Symbiotic relationship with **Electricity Boards** for regular, uninterrupted supply
- Most **sustainable methods** of water treatment e.g. RO, UV
- Robust PPP with **sub-contracting processes** that are financially viable but weighs in social impact as much as economic gains

- Work with **Ecolab** on using their testing labs for more frequent water testing
- Work with **Ecolab** to continue defining and refining sustainable water treatment methods
- Reach out, via the **Ministry of Water**, to the Electricity Boards
- Work with **Government e-Marketplace (GEM)** to draft tenders that will measure the right social parameters, while being financially viable





# Plan going forward: **C.E.A**. (Adoption)



- Ensuring high **uptime** of water ATMs
- Adherence to minimum **standards** and SLAs (service level agreements)
- Continuous **feedback** from operators and customers to improve quality of service (e.g., bottles of different sizes)
- Ensuring presence of water ATMs do not adversely impact **supply** of regular water to nearby localities

- Work with the **sub-contractors** and contract for minimum standards, SLAs and uptime
- Set up a real time customer and operator **feedback mechanism** and a **central team** to understand and act upon it
- Ensure no adverse impact of water ATM on local neighbourhood; set up a **rapid response** feedback team



# Help needed



## Access

- Google
- GMDA
- Ministry of Water
- Electricity Board
- GEM (Govt e-Marketplace)
- Government bodies
- NGOs



## Funds

- INR 15-30 cr for 500 **ATMs set up cost**
- INR 10 lakhs for setup of a portal for water **ATMs knowledge base** and continuous feedback and closure
- INR 15 lakhs p.a. for **logistics of sending water samples** to labs once each month + 5 lakhs p.a. for testing
- For **payment to sub-contractors**, although water ATMs should be **cost neutral** once operational



## Resources

- 500-600 operators (typically women) for **operating water ATMs**
- **Multiple sub-contractors** (5-6) for setup and run of the water ATMs



## Policies

- For **hiring women operators** and premium therein
- For **tender process** that optimizes social and economic cost benefits





# THANK YOU

